



# Thermal Storage Retrofit at Moorhead Federal Building

June 25<sup>th</sup>, 2002

Chicago, IL

Earl Rudolph

Calmac Manufacturing Corp

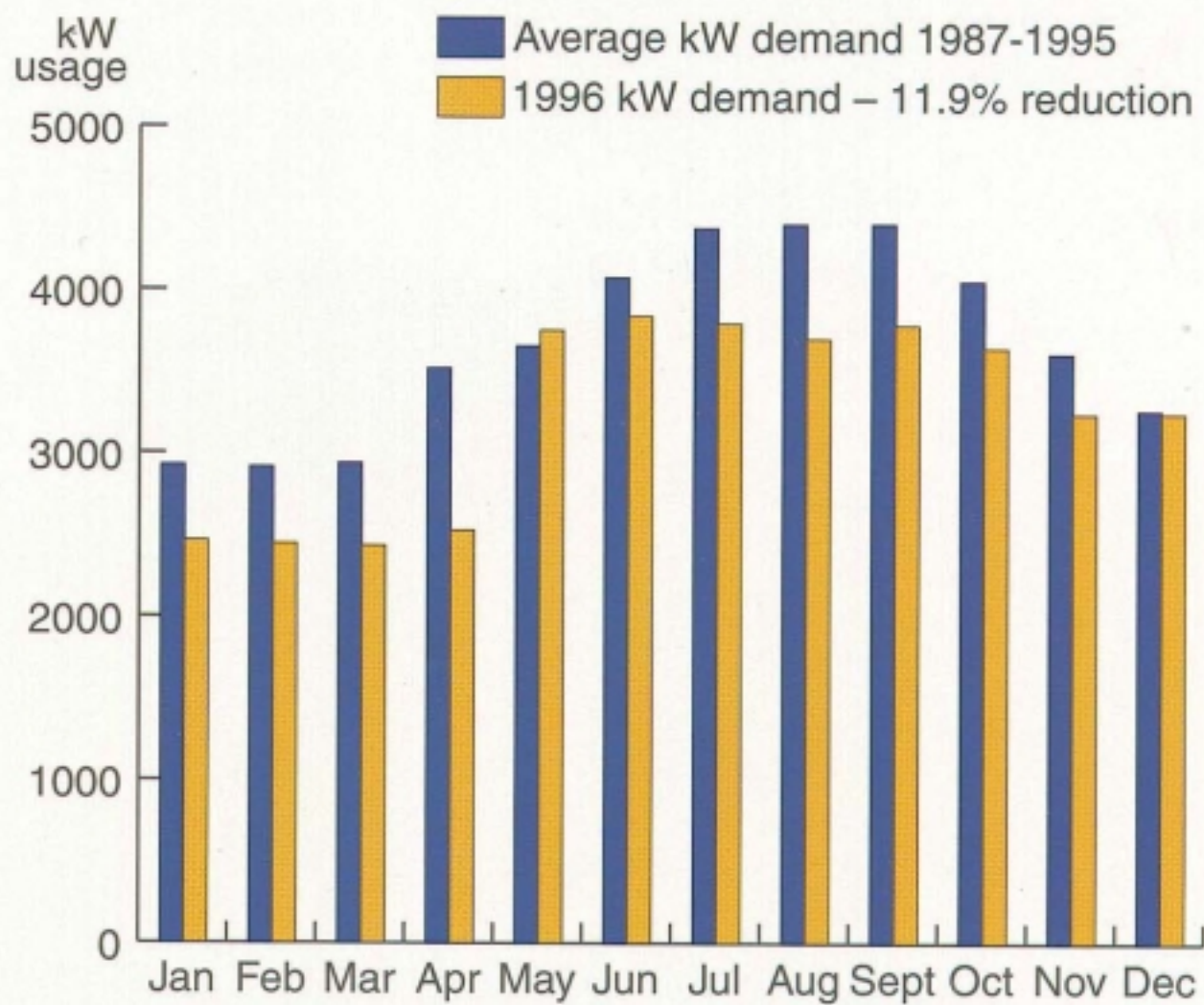
# Moorhead Federal Building



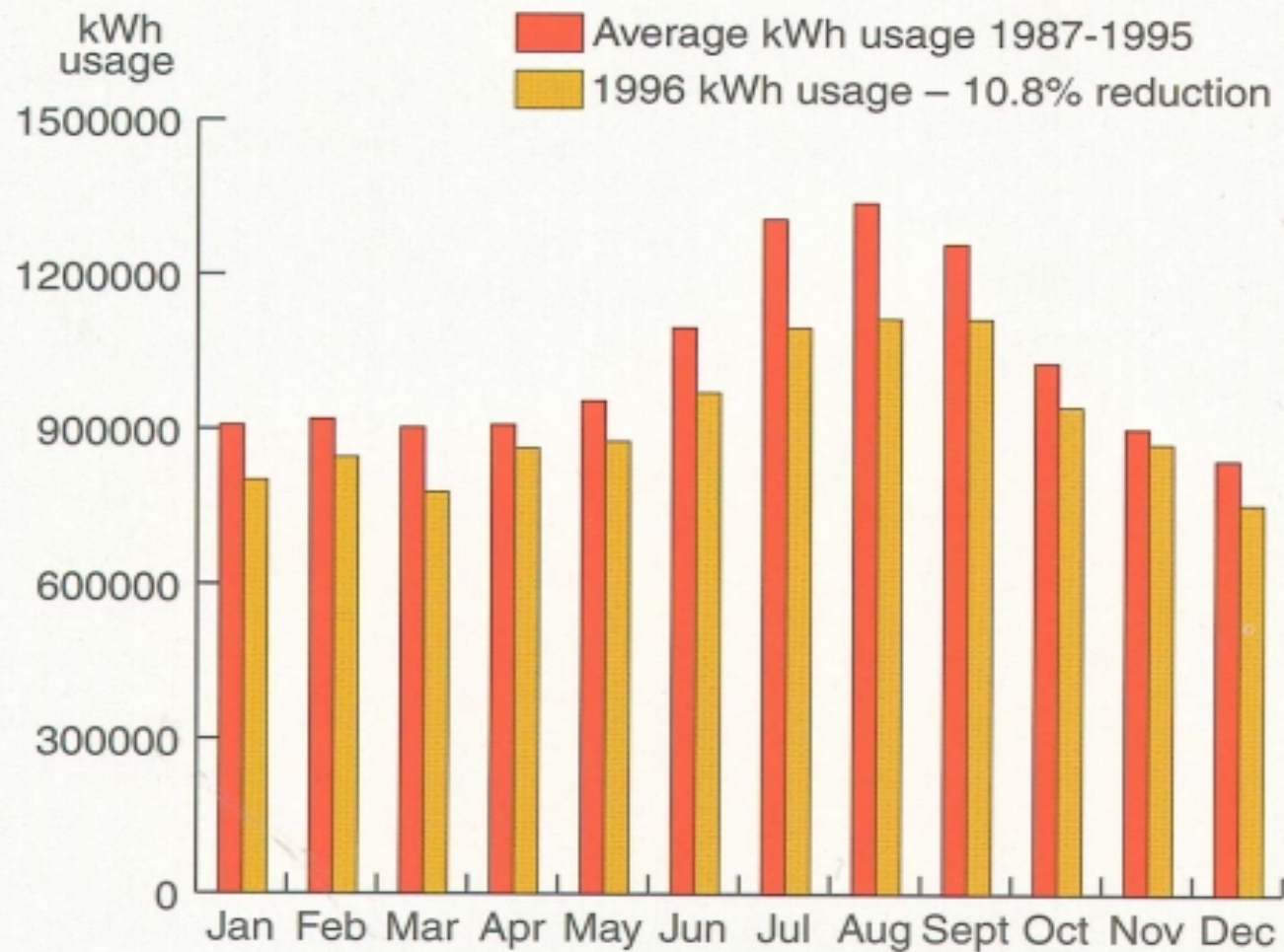
- 27 Story Office Building
- Constructed in 1963
- Standard Occupancy
- Federal Agency Tenants

## Flexibility – A Major Benefit

- In July and August use ice storage to minimize electrical demand from noon until 4:00 PM
- Make ice from 6:00 PM until 6:00 AM
- During “shoulder” months make less ice to handle reduced cooling load
- Cool with ice on mild days, turn chillers off
- Cooling system is inoperative weekends, holidays



*Demand Reduction vs. Historical*



*Energy Reduction vs. Historical*

# Environmental Advantages of TES



- Consumes Efficient Off Peak Power for On Peak Usage
- Lowers On-Peak Demand
- Reduces Power Plant Greenhouse Emissions
- Utilizes Existing Power Company Resources

# Owner Advantages of TES



- Lowers on Peak Demand charges
- Uses Efficient Off Peak Energy
- Can Reduce on Site Refrigerant Volumes and Cooling Tower Size
- Offers Pumping Savings
- Offers Chiller Maintenance Scheduling During Normal Business Hours
- Can Provide Cooling After Winterization
- Can Provide Emergency Backup Cooling





# Midwest Calmac Installations

- Standard Federal Bank HQ– Troy, MI
- NBD Technology Center – Van Buren Township, MI
- Nissan Technical HQ – Farmington Hills, MI
- Underwriters Laboratories – Chicago, IL
- Motorola Training & Education Center – Schaumburg, IL
- Honeywell Microswitch – Freeport, IL
- First National Bank – Akron, OH
- First National Bank – Cincinnati, OH
- General Electric Co. – Cincinnati, OH
- Honeywell – Dublin, OH





# Midwest Calmac Installations

- Alliant Energy – Madison, WI
- Schneider National – Green Bay, WI
- First Interstate Bank – Milwaukee, WI
- Ft. Wayne International Airport – Ft. Wayne, IN
- ITT – Ft. Wayne, IN
- Indiana Wesleyan University – Indianapolis, IN
- Ohio Northern University – Ada, OH
- Ohio University – Athens, OH
- Xavier University – Cincinnati, OH
- Case Western Reserve University – Garfield Heights, OH



# Questions?

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